

Application #: 10/815,082

Amendment Date: May 10, 2007

Reply to Office Action: March 6, 2007

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The listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. **(Currently Amended)** An optical fiber for the transmission of optical energy, the optical fiber comprising:

a cladding region including a photonic band gap structure with non-circular holes, the optical energy having a wavelength within the photonic band gap of the photonic band gap structure; and

a core region surrounded by the photonic band gap structure,  
wherein the photonic band gap fiber guides the optical energy substantially within the core region with a loss of less than about 300 dB/km and wherein the optical energy is guided in a mode having a nonlinear refractive index of less than about  $10^{-18}$  cm<sup>2</sup>/W.

2. **(Original)** The optical fiber of claim 1 wherein the optical energy has a wavelength between about 150 nm and about 11  $\mu$ m.

3. **(Original)** The optical fiber of claim 1 wherein the core region has a lower effective refractive index than the average refractive index of the photonic band gap structure.

4. **(Original)** The optical fiber of claim 1 wherein the core region is composed substantially of a gaseous material.

5. **(Original)** The optical fiber of claim 1 wherein the optical energy has a wavelength greater than about 1000 nm.

6. **(Original)** The optical fiber of claim 1 wherein the photonic band gap fiber guides the optical energy substantially within the core region with a loss of less than about 200 dB/km.

7. **(Original)** The optical fiber of claim 1 wherein the photonic band gap fiber guides the optical energy substantially within the core region with a loss of less than about 50 dB/km.

8. **(Original)** The optical fiber of claim 1 wherein the photonic band gap fiber guides the optical energy substantially within the core region with a loss of less than about 20 dB/km.

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9. **(Original)** The optical fiber of claim 8 wherein the optical energy has a wavelength between about 1400 nm and about 1500 nm.

10. **(Original)** The optical fiber of claim 8 wherein the optical energy has a wavelength between about 1680 and 1900 nm.

11. **(Cancelled)**

12. **(Original)** The optical fiber of claim 1 wherein the optical signal is guided in a mode having a nonlinear refractive index of less than about  $5 \times 10^{-19} \text{ cm}^2/\text{W}$ .

13. **(Previously presented)** The optical fiber of claim 1 wherein the optical fiber is configured to support a temporal soliton having a peak power of greater than about 1 MW.

14. **(Original)** The optical fiber of claim 1 having a dispersion of greater than 20 ps/nm/km at a wavelength within the photonic band gap.

15. **(Original)** The optical fiber of claim 1 wherein the optical fiber is fabricated by a stack-and-draw method.

16. **(Original)** The optical fiber of claim 1 wherein the optical fiber supports at least two modes guided substantially within the core.

17. **(Original)** The optical fiber of claim 1 wherein the optical energy propagates in the optical fiber with a wavelength and propagation constant within the band gap of the photonic band gap structure.

18. **(Original)** The optical fiber of claim 1, wherein the core region has a maximum diameter less than about four times the pitch of the photonic band gap structure of the cladding region

19. **(Original)** An optical fiber for the transmission of optical energy, the optical fiber comprising:

a core region; and

a cladding region,

wherein the optical fiber guides the optical energy in a mode having a nonlinear refractive index of less than about  $10^{-18}$  cm<sup>2</sup>/W.

20. (**Original**) The optical fiber of claim 19 wherein the optical signal is guided in a mode having a nonlinear refractive index of less than about  $5 \times 10^{-19}$  cm<sup>2</sup>/W.

21. (**Previously Presented**) The optical fiber of claim 19 wherein the optical fiber is configured to support a temporal soliton having a peak power of greater than about 1 MW.

22. (**Original**) The optical fiber of claim 19 wherein the photonic band gap fiber guides the optical energy substantially within the core region with a loss of less than about 300 dB/km.

23. (**Original**) The optical fiber of claim 19 wherein the photonic band gap fiber guides the optical energy substantially within the core region with a loss of less than about 50 dB/km.

24. (**Previously Presented**) The optical fiber of claim 19, wherein the cladding region is formed from a photonic band gap structure, the optical energy propagates as a temporal soliton having a wavelength within the photonic band gap of the photonic band gap structure; and wherein the core region is surrounded by the photonic band gap structure.

25. (**Previously Presented**) An optical fiber comprising  
a core region; and  
a cladding region,

wherein the optical fiber is configured to support a temporal soliton having a peak power of greater than about 1 MW.

26. (**Previously Presented**) The optical fiber of claim 25, wherein the optical fiber is configured to support a temporal soliton having a peak power of greater than about 3 MW.

27. (**Original**) The optical fiber of claim 25, wherein the cladding region is formed from a photonic band gap structure, the soliton having a wavelength within the photonic band gap of the photonic band gap structure; and wherein the core region is surrounded by the photonic band gap structure.